

CLAIMS

1. An automatic transmission comprising:

an input shaft that rotates based on output rotation of a drive source;

a planetary gear unit comprised of first, second, third, and fourth rotation components;

reduced rotation output means capable of outputting a reduced rotation to said first rotation component from said input shaft wherein the rotation speed is reduced;

a first clutch that links said input shaft and said second rotation component in a manner capable of disengaging;

a second clutch that links said input shaft and said third rotation component in a manner capable of disengaging; and

an output unit that outputs the rotation of said fourth rotation component to a drive wheel transmission mechanism;

wherein said reduced rotation output means and said first clutch are configured on one side in the axial direction of said planetary gear unit;

and wherein said second clutch is configured on the other side in the axial direction of said planetary gear unit.

2. An automatic transmission according to Claim 1, further comprising a linking member for linking said reduced

rotation output means and said planetary gear unit,

wherein said first clutch is configured on the inner circumference side of said linking member.

3. An automatic transmission according to either Claim 1 or 2, said reduced rotation output means further comprising an input rotation component for inputting rotations of said input shaft at all times, a fixing component for fixing rotations at all times, a speed reduction planetary gear that has a reduced rotation component that rotates at said reduced rotation, and a third clutch that can link the linking member between said reduced rotation component and said first rotation component in a manner capable of disengaging;

wherein said reduced rotation is transmitted to said first rotation component by said third clutch engaging.

4. An automatic transmission according to Claim 3, wherein said first clutch is configured on the inner circumference side of said third clutch.

5. An automatic transmission according to Claim 4, said third clutch comprising a friction member and a drum unit and a hub unit that link with said friction member, wherein;

said hub unit links with said reduced rotation component;

said drum unit forms an oil pressure servo with a piston sealed in an oil-tight manner, and links with said

first rotation component; and

said first clutch is configured on the inner circumference side of said drum member.

6. An automatic transmission according to Claim 5, wherein the friction member of said third clutch is located on the outer circumference side of said speed reduction planetary gear;

and wherein an oil pressure servo of said third clutch is disposed adjoining said speed reduction planetary gear on the opposite side of said planetary gear unit in the axial direction.

7. An automatic transmission according to Claim 6, wherein an oil pressure servo of a first brake for retaining said first rotating component of said planetary gear unit to which reduced rotation is input, is configured on the outer circumference of the oil pressure servo of said third clutch.

8. An automatic transmission according to either Claim 1 or 2, said reduced rotation output means further comprising an input rotation component capable of inputting rotations of said input shaft, a fixing component for fixing rotations at all times, a speed reduction planetary gear unit that has a reduced rotation component that links to said first rotation component at all times, and rotates at said reduced rotation, and a third clutch that can link the linking member between said input shaft and said input rotation

component in a manner capable of disengaging;

wherein said reduced rotation is transmitted to said first rotation component by said third clutch engaging.

9. An automatic transmission according to any one of the Claims 3 through 8,:

wherein a fixing component of said speed reduction planetary gear is fixed and configured on a first boss unit extending from one edge of a side wall of a case;

an oil pressure servo of said third clutch is configured on the outside of said first boss unit;

an oil pressure servo of said second clutch is configured on the outside of said second boss unit that extends from another edge of a side wall of said case;

said first clutch is configured adjoined to said planetary gear and also comprises a friction member and an oil pressure servo for pressurizing said friction member, and a drum unit and hub unit configured integrally with said oil pressure servo;

and said drum unit is linked with said input shaft.

10. An automatic transmission according to either Claim 1 or 2, said reduced rotation output means further comprising an input rotation component for inputting rotations of said input shaft, a fixing component for fixing rotations, a speed reduction planetary gear that has a reduced rotation component that links to said first rotation component at all

times, and rotates at said reduced rotation, a third clutch that can link the linking member between said input shaft and said input rotation component in a manner capable of disengaging, and a third brake capable of fixing the rotations of said fixing component;

wherein said reduced rotation is transmitted to said first rotation component by said third clutch and said third brake engaging.

11. An automatic transmission according to any one of the Claims 8 through 10, further comprising:

a linking member for linking said reduced rotation output means and said planetary gear unit;

wherein said third clutch is disposed on the inner circumference side of said linking member.

12. An automatic transmission according to Claim 11, wherein said first clutch and said third clutch are configured adjacent in the axial direction, on the inner circumference side of said linking member.

13. An automatic transmission according to Claim 12, said third clutch comprising a friction member and an oil pressure servo for pressurizing said friction member;

wherein said oil pressure servo is configured on the opposite side in the axial direction of said speed reduction planetary gear as to said friction member;

and wherein a drum unit that configures a cylinder of

said oil pressure servo is linked with said input shaft.

14. An automatic transmission according to Claim 13, wherein the oil pressure servo of said third clutch is configured adjoining the oil pressure servo of said first clutch, between the oil pressure servo of said first clutch and the friction material of said third clutch.

15. An automatic transmission according to Claim 10, further comprising:

a linking member for linking said reduced rotation output means and said planetary gear unit;

wherein said third brake is configured on the opposite side in the axial direction of said planetary gear unit as to said speed reduction planetary gear.

16. An automatic transmission according to Claim 15, wherein the oil pressure servo of said third brake is provided in a case.

17. An automatic transmission according to either Claim 15 or 16, said third clutch comprising a friction member and an oil pressure servo for pressurizing said friction member;

wherein said oil pressure servo is configured on the opposite side in the axial direction of said speed reduction planetary gear as to said friction member;

and wherein a drum unit that configures a cylinder of said oil pressure servo is linked with said input shaft.

18. An automatic transmission according to either Claim 1

or 2, said reduced rotation output means further comprising an input rotation component for inputting rotations of said input shaft, a fixing component for fixing rotations, a speed reduction planetary gear that has a reduced rotation component that rotates at said reduced rotation and that is connected to said first rotating component at all times, and a third brake capable of fixing the rotations of said fixing component;

wherein said reduced rotation is transmitted to said first rotation component by said third brake engaging.

19. An automatic transmission according to Claim 18, wherein said third brake is configured on the opposite side in the axial direction of said planetary gear unit as to said speed reduction planetary gear;

and wherein the oil pressure servo of said third brake is provided in a case.

20. An automatic transmission according to any one of the Claims 1 through 19, wherein six forward speed levels and one reverse speed level can be achieved, and in the case of the fourth forward speed level said first clutch and said second clutch are engaged.

21. An automatic transmission according to Claim 20, wherein, in a speed line chart illustrating the revolutions of said first, second, third, and fourth rotation components with the vertical axis, and the gear ratio of said first,

second, third, and fourth rotation components with the horizontal axis in a corresponding manner;

said first rotation component to which said reduced rotation is input is positioned at the farthest edge in the horizontal direction, with said third rotation component, said fourth rotation component linked to said output member, and said second rotation component, corresponding in that order.

22. An automatic transmission according to either Claim 20 or 21, wherein said planetary gear unit is a multiple type planetary gear, comprising a first sun gear, a long pinion which meshes with said first sun gear, a short pinion which meshes with said long pinion, a carrier for rotationally supporting said long pinion and said short pinion, a second sun gear meshing with said short pinion, and a ring gear meshing with said long pinion;

wherein said first rotation component is said first sun gear capable of inputting the reduced rotation of said reduced rotation output means, and which is capable of being fixed by the retaining of said first brake;

and wherein said second rotation component is said second sun gear capable of inputting rotations of said input shaft by the engaging of said first clutch;

and wherein said third rotation component is said carrier capable of inputting the rotations of said input



shaft by the engaging of said second clutch, and which is capable of being fixed by the retaining of said second brake;

and wherein said fourth rotation component is said ring gear linked to said output member.

23. An automatic transmission according to either Claim 20 or 21, comprising a pair of said planetary gear units each comprising a first sun gear, a second sun gear linked to said first sun gear, a first carrier meshing with said first sun gear, a second carrier meshing with said second sun gear, a first ring gear linked to said second carrier, and a second ring gear meshing with said second carrier;

wherein said first rotation component is said second ring gear capable of inputting the reduced rotation of said reduced rotation output means, and which is capable of being fixed by the retaining of said first brake;

and wherein said second rotation component is said first sun gear and said second sun gear capable of inputting the rotations of said input shaft by the engaging of said first clutch;

and wherein said third rotation component is said second carrier and said first ring gear capable of inputting the rotations of said input shaft by the engaging of said second clutch, and also capable of being fixed by the retaining of said second brake;

and wherein said fourth rotation component is a first carrier linked to said output member.

24. An automatic transmission according to either Claim 22 or 23, wherein, in the first speed forward, said first clutch is engaged and said second brake is retained;

and wherein, in the second speed forward, said first clutch is engaged and said first brake is retained;

and wherein, in the third speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said first clutch is engaged;

and wherein, in the fourth speed forward, said first clutch and said second clutch are both engaged;

and wherein, in the fifth speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said second clutch is engaged;

and wherein, in the sixth speed forward, said second clutch is engaged and said first brake is retained;

and wherein, in the first speed reverse, reduced rotation is input to said first rotation component from said reduced rotation output means, and said second brake is retained;

whereby six forward speed levels and one reverse speed level can be achieved.

25. An automatic transmission according to any one of the Claims 1 through 19, wherein six forward speed levels and one reverse speed level can be achieved, and in the case of the fifth forward speed level said first clutch and said second clutch are engaged.

26. An automatic transmission according to Claim 25, wherein, in a speed line chart illustrating the revolutions of said first, second, third, and fourth rotation components with the vertical axis, and the gear ratio of said first, second, third, and fourth rotation components with the horizontal axis in a corresponding manner;

said first rotation component to which said reduced rotation is input is positioned at the farthest edge in the horizontal direction, with said fourth rotation component linked to said output member, said third rotation component, and said second rotation component, corresponding in that order.

27. An automatic transmission according to either Claim 25 or 26, wherein said planetary gear unit is a multiple type planetary gear, comprising a first sun gear, a long pinion which meshes with said first sun gear, a short pinion which meshes with said long pinion, a carrier for rotationally supporting said long pinion and said short pinion, a second sun gear meshing with said short pinion, and a ring gear meshing with said long pinion;

wherein said first rotation component is said second sun gear capable of inputting the reduced rotation of said reduced rotation output means;

and wherein said rotation component is said carrier capable of inputting rotations of said input shaft by the engaging of said first clutch, and which is capable of being fixed by the retaining of said first brake;

and wherein said third rotation component is said first sun gear capable of inputting the rotations of said input shaft by the engaging of said second clutch, and which is capable of being fixed by the retaining of said second brake;

and wherein said fourth rotation component is said ring gear linked to said output member.

28. An automatic transmission according to Claim 27, wherein, in the first speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said first brake is retained;

and wherein, in the second speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said second brake is retained;

and wherein, in the third speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said second clutch is

engaged;

and wherein, in the fourth speed forward, reduced rotation is input to said first rotation component from said reduced rotation output means, and said first clutch is engaged;

and wherein, in the fifth speed forward, said first clutch and said second clutch are both engaged;

and wherein, in the sixth speed forward, said first clutch is engaged and said second brake is retained;

and wherein, in the first speed reverse, said second clutch is engaged and said first brake is retained;

whereby six forward speed levels and one reverse speed level can be achieved.

29. An automatic transmission according to any one of the Claims 1 through 28, wherein said first clutch is configured on the opposite side in the axial direction of said planetary gear unit as to said speed reduction planetary gear.

30. An automatic transmission according to any one of the Claims 20 through 24, wherein said first clutch is a clutch which engages at a relatively low to medium speed level.

31. An automatic transmission according to any one of the Claims 25 through 28, wherein said second clutch is a clutch that engages at the reverse level.

32. An automatic transmission according to any one of the

Claims 1 through 31, wherein said first clutch comprises a friction plate of which the inner circumferential side is splined to a member linked to said second rotation component, a first drum member encompassing an oil pressure servo and which is splined to the outer circumferential side of said friction plate, a first piston member for pressing said friction plate, and a first oil pressure servo oil pressure chamber formed by sealing between the inner circumferential side of said first piston member and said first drum member so as to be liquid-tight;

and wherein said second clutch comprises a friction plate of which the inner circumferential side is splined to a member linked to said third rotation component, a second drum member encompassing an oil pressure servo and which is splined to the outer circumferential side of said friction plate, and is disposed in the inner circumference side of a member linked to said second rotation component, a second piston member for pressing said friction plate, and a second oil pressure servo oil pressure chamber formed by sealing between the inner circumferential side of said second piston member and said input shaft, and between said outer circumference side and said second drum member, so as to be liquid-tight.

33. An automatic transmission according to any one of the Claims 1 through 32, wherein said output member is disposed

between said planetary gear unit and said reduced rotation output means in said axial direction.

34. An automatic transmission according to any one of the Claims 1 through 33, wherein said output member is disposed between said planetary gear unit and said second clutch in said axial direction.

35. An automatic transmission according to any one of the Claims 1 through 34, wherein said reduced rotation output means comprise a speed reduction planetary gear formed of a double pinion planetary gear;

and wherein said speed reduction planetary gear, said planetary gear unit, and said output member, are provided coaxially with said input shaft.

36. An automatic transmission according to any one of the Claims 1 through 35, further comprising a differential unit for outputting rotations to driving wheels, and a counter shaft unit for engaging said differential unit, wherein said output member is a counter gear meshing with said counter shaft unit.